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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* WEISHUN NI,
SATISH SHANTILAL SHAH
and TIMOTHY P. WALGREN

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Appeal 2015-004638
Application 13/034,864
Technology Center 3700

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Before JOHN C. KERINS, JAMES P. CALVE, and WILLIAM A. CAPP, *Administrative Patent Judges*.

CALVE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the final rejection of claims 1–7 and 9–24. Appeal Br. 7. Claim 8 was cancelled. Amendment, filed Feb. 28, 2014, at 2, 6. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

## CLAIMED SUBJECT MATTER

Claims 1, 11, and 17 are independent. Claim 1 is reproduced below.

> 1. A bearing comprising:
> a bridge land geometry having a finger cut that defines a width ISW, a center of said width ISW displaced from an axis a radial distance ISR, a ratio of ISW/ISR between 0.074–0.293.

## REJECTIONS[1]

Claims 1–7, 9, 10, 20, 23, and 24 are rejected under 35 U.S.C. § 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Halter (US 6,042,352, iss. Mar. 28, 2000).

Claims 11–19, 21, and 22 are rejected under 35 U.S.C. § 103(a) as unpatentable over Halter and Lauck (US 3,003,426, iss. Oct. 10, 1961).

## ANALYSIS

*Claims 1–7, 9, 10, 20, 23, and 24 anticipated by or unpatentable over Halter*

The Examiner found that Halter discloses bearing 10 with bridge land geometry, finger cut 24, 27 that defines a width ISW, and a center of width ISW displaced from an axis by radial distance ISR, wherein the ratio of ISW to ISR ranges between 0.074–0.293. Final Act. 3. The Examiner found that Figure 2 appears to show the relative dimensions of a bridge land geometry with a finger cut, ISW, ISR, and a ratio of 0.074–0.293, wherein the ratio is deemed inherent absent evidence to the contrary. *Id.* The Examiner also determined that the claimed ratio would have been obvious because the general conditions of a claim are disclosed in the prior art and discovery of optimum or workable ranges involves only routine skill in the art. *Id.* at 4.

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[1] The Examiner withdrew the rejection of claims 13–15 under 35 U.S.C. § 112, second paragraph, as being indefinite. *See* Ans. 2.

There are two issues before us. First, we consider whether Halter anticipates the claimed bearing, particularly the claimed ratio of ISW to ISR. Second, we consider whether Halter renders obvious the claimed bearing and its claimed ratio of 0.074–0.293.

Anticipation by Halter

Appellants argue that the Examiner has not established inherency of the claimed ratio because the Examiner has not shown that the claimed ratio is necessarily present in Halter, as required. Appeal Br. 3. Appellants also argue that the Examiner even acknowledges that the ratio is not inherent by asserting that the ratio "appears to be in the claimed range." *Id.* Appellants further argue that a mere presence in Halter of a finger cut and bridge land feature is not sufficient to establish the claimed ratio, especially when Halter does not disclose dimensions or relationships of the features. *Id.* at 4–5.

While we appreciate the Examiner's position that Figure 2 of Halter discloses features that correspond to the claimed finger cut including a width and radial distance that are depicted with dimensions that provide a ratio, the Examiner has not established that these features *necessarily* yield a ratio of ISW/ISR between 0.074–0.293, as claimed. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.").

The Examiner has not established that Halter's figures are drawn to scale or that Halter discloses dimensions for the claimed features. "[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue." *See Hockerson-Halberstadt, Inc. v. Avia Group Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000).

The Examiner is correct that drawings can be relied upon for what they show and can be cited against claims of a utility patent. *In re Aslanian*, 590 F.2d 911, 914 (CCPA 1979). If claim 1 recited a bridge land geometry having a finger cut that defines a width ISW, a center of which is displaced from an axis by a radial distance ISR, Figure 2 of Halter would anticipate. However, claim 1 recites a precise ratio based on the relative dimensions and proportions of the width ISW of the finger cut to its radial distance. Halter does not provide such a disclosure in Figure 2 or the specification sufficient to anticipate that claimed ratio, expressly or inherently. *See* Halter, 3:16–19.

We do not sustain the rejection of claim 1 as anticipated by Halter.

Obviousness of Claim 1

Appellants also argue that the claimed ratio is not obvious because the Examiner has not explained how the general conditions of the claim would lead to the claimed ratio or why a skilled artisan would recognize the ratio. *Id.* at 5. Appellants argue that only result effective variables are optimized and a particular parameter must be recognized as a result-effective variable with objective evidence disclosing the claimed relationship. *Id.* Appellants also argue that the Examiner's annotation on Figure 2, allegedly showing the claimed ratio, is not proper because Halter is silent regarding dimensions of these features or the figures being drawn to scale. *Id.* at 6–7. We agree.

The Examiner has not made sufficient findings to establish the general conditions of the prior art such that it would have been obvious to arrive at the claimed ratio of ISW/ISR of 0.074–0.293 by discovering the optimum or workable ranges using routine skill in the art. The Examiner's conclusory determination does not provide the necessary factual findings to support an obvious determination on this ground. *See* Final Act. 4; Ans. 6, 7–8.

The rule regarding discovering workable or optimum ranges based on the disclosure of the general conditions of a claim in the prior art "is limited to cases in which the optimized variable is a 'result-effective variable.'" *In re Applied Materials, Inc.*, 692 F.3d 1289, 1295 (Fed. Cir. 2012) (citations omitted). "A recognition in the prior art that a property is affected by the variable is sufficient to find the variable result-effective." *Id.* at 1297. An "absence of any disclosure regarding the relationship between the variable and the affected property may preclude a finding that the variable is result-effective," however. *Id.* (prior art taught that claimed groove dimensions on polishing pads were result-effective and modifiable to affect pad traits).

In this case, the Examiner did not identify any disclosure in Halter or the prior art generally that skilled artisans recognized the ratio of ISW to ISR or even the ISW or ISR individually as affecting a property of a gear pump. In this regard, Halter discloses an improved bearing with a pulsed bleed hole configuration that minimizes cavitation in the gear pump. Halter, 1:5–9. As shown in Figures 2–7, pulse bleed hole 44 is formed in bearing dams 14, 16, which correspond to the claimed finger cut, to pulse fluid into the inter-tooth volume 54 between interlocking gears 50 and minimize formation of vapor cavities that cause cavitation during tooth mesh cycle. *Id.* at 3:19–46, 3:64–4:19. Halter discloses different configurations for the bleed holes and their respective efficacy in reducing cavitation. *Id.* at 4:20–56, Figs. 3–7. Bleed holes are located at a bottom of each dam 14 (Fig. 3), but the Examiner has not identified any recognition in Halter that the width or radial distance of each dam (or the bleed hole therein) affects cavitation or any other property such that a skilled artisan would have been motivated to optimize the values as claimed. *See In re Urbanski*, 809 F.3d 1237, 1242 (Fed. Cir. 2016).

Absent such findings by the Examiner, we do not sustain the rejection of claim 1 as unpatentable over Halter.[2] The Examiner's findings that Halter teaches features of dependent claims 2–7, 9, 10, 20, 23, and 24 do not cure these deficiencies. Thus, we do not sustain the rejection of those claims.

*Claims 11–19, 21, and 22 as unpatentable over Halter and Lauck*

Independent claim 11 recites a gear pump comprising a first shaft, a first gear, and a first bearing with the claimed geometry and ratio recited in claim 1. Independent claim 17 recites a method of installing a gear within a gear pump with a first bearing including the ratio recited in claim 1.

The Examiner found that Halter discloses a gear pump including first bearing 10 that supports a first gear where first bearing 10 includes a finger cut that defines a width ISW, a center of width ISW displaced from a first axis by a radial distance ISR, wherein a radio of ISW to ISR ranges between 0.074–0.293. Final Act. 7, 10. The Examiner found that Figure 2 appears to show dimensions of a bridge land geometry and a finger cut defining a width ISW, radial distance ISR, and a ratio of ISW/ISR of 0.074–0.293 inherently. *Id.* The Examiner determined the claimed ratio would have been obvious as the general conditions are disclosed in the prior art and discovering optimum or workable ranges involves routine skill in the art. *Id.* at 8. The Examiner relied on Lauck to teach a first shaft and first gear recited in claim 11. *Id.*

Appellants assert the same arguments against the claimed ratio as for claim 1. Appeal Br. 3–7. Those arguments are persuasive for the reasons discussed above for claim 1. Thus, we do not sustain this rejection.

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[2] Appellants disclose the claimed ratio as facilitating critical fluid interchange at the main stage gear mesh. Spec. ¶ 39.

## DECISION

We reverse the rejections of claims 1–7 and 9–24.

REVERSED